CLAIMS

What is claimed is:

1. A method for reducing the resolution of media data, said method comprising:

receiving input data comprised of compressed data for a frame of a plurality of frames, wherein said frame is at a first resolution;

downsampling said input data to generate compressed downsampled data at a second resolution that is reduced relative to said first resolution, said compressed downsampled data used to generate a frame at said second resolution;

decoding said compressed downsampled data to generate decompressed downsampled data at said second resolution; and

upsampling said decompressed downsampled data to generate decompressed data at a resolution corresponding to said first resolution, said decoding and said upsampling performed provided said decompressed data are needed as a reference for another frame.

2. The method as recited in Claim 1 wherein said input data comprise motion vectors, wherein said method comprises:

generating motion vectors for said frame at said second resolution using said motion vectors from said input data.

3. The method as recited in Claim 2 wherein said motion vectors for said frame at said second resolution are generated by averaging said motion vectors from said input data.

4. The method as recited in Claim 1 wherein said input data are compressed according to a discrete cosine transform-based compression scheme, wherein said input data comprise discrete cosine transform (DCT) coefficients.

5. The method as recited in Claim 4 comprising:

generating an output data stream comprising said frame at said second resolution; and

determining a bit rate for said output data stream using said DCT coefficients from said input data.

6. The method as recited in Claim 5 wherein said input data are encoded according to a first compression scheme and said output data stream are encoded according to a second compression scheme.

7. The method as recited in Claim 1 wherein said media data are selected from the group comprising: video data, audio data, image data, graphic data, and web page data.

8. A method for reducing the resolution of media data, said method comprising:

receiving input data comprised of compressed data for a plurality of macroblocks, wherein a macroblock is characterized as a first coding type if said macroblock is dependent on a macroblock from a reference frame and is otherwise characterized as a second coding type;

selecting data processing functions according to the number of macroblocks characterized as said first coding type and the number of macroblocks characterized as said second coding type; and

generating an output macroblock from said plurality of macroblocks using said data processing functions, said output macroblock providing a reduced resolution relative to said input data.

9. The method as recited in Claim 8 comprising:

determining a coding type for said output macroblock according to the number of macroblocks characterized as said first coding type and the number of macroblocks characterized as said second coding type; and

selecting said data processing functions according to said coding type of said output macroblock.

10. The method as recited in Claim 9 wherein, provided said output macroblock is characterized as said first coding type, said data processing functions comprising:

constructing a predicted macroblock for each macroblock in said plurality of macroblocks by applying motion compensation to a respective macroblock in a reference frame, wherein said constructing comprises a decoding function such that said predicted macroblocks comprise decompressed data;

downsampling said predicted macroblocks to generate a downsampled macroblock; and

encoding said downsampled macroblock to generate said output macroblock.

11. The method as recited in Claim 8 wherein, provided all of said plurality of macroblocks are characterized as said second coding type, said data processing functions comprise:

downsampling said input data to generate said output macroblock comprising compressed downsampled data.

12. The method as recited in Claim 11 comprising:

decoding said compressed downsampled data to generate decompressed downsampled data; and

upsampling said decompressed downsampled data.

13. The method as recited in Claim 8 wherein, provided the number of macroblocks characterized as said second coding type satisfy a second threshold and do not exceed a first threshold, said data processing functions comprise:

constructing a predicted macroblock for each macroblock in said plurality of macroblocks by applying motion compensation to a respective macroblock in a reference frame, wherein said constructing comprises a decoding function such that said predicted macroblocks comprise decompressed data;

downsampling said predicted macroblocks to generate a downsampled macroblock; and

encoding said downsampled macroblock to generate said output macroblock.

14. The method as recited in Claim 8 wherein, provided the number of macroblocks characterized as said second coding type satisfy a first threshold, said data processing functions comprise:

constructing a predicted macroblock for each macroblock characterized as said first coding type by applying motion compensation to a respective macroblock in a reference frame, wherein said constructing comprises a decoding function such that a predicted macroblock comprises decompressed data;

encoding each predicted macroblock; and

downsampling predicted macroblocks and said macroblocks characterized as said second coding type to generate said output macroblock comprising compressed downsampled data.

15. The method as recited in Claim 14 comprising:

decoding said compressed downsampled data to generate decompressed downsampled data; and

upsampling said decompressed downsampled data.

16. The method as recited in Claim 8 wherein said input data comprise motion vectors, said method comprising:

generating a motion vector for said output macroblock by averaging said motion vectors.

17. The method as recited in Claim 8 wherein said input data are compressed according to a discrete cosine transform-based compression scheme.

18. The method as recited in Claim 17 comprising:

generating a quantization parameter for said output macroblock using quantization parameters for said plurality of macroblocks.

19. A system for reducing the resolution of media data, said system comprising:

an input buffer adapted to receive input data at a first resolution, said input data comprising compressed data for a plurality of macroblocks, wherein a macroblock is characterized as a first coding type if said macroblock is dependent on a macroblock from another frame and is otherwise characterized as a second coding type;

a downsampler coupled to said input buffer, said downsampler adapted to generate compressed downsampled data at a second resolution that is reduced relative to said first resolution;

a decoder coupled to said downsampler, said decoder adapted to generate decompressed downsampled data; and

an upsampler coupled to said first decoder, said upsampler adapted to generate decompressed data at a resolution corresponding to said first resolution.

20. The system of Claim 19 comprising:

a mode selector coupled to said input buffer, said mode selector adapted to select data processing functions according to the number of macroblocks characterized as said first coding type and the number of macroblocks characterized as said second coding type.

21. The system of Claim 19 comprising:

a motion vector generator coupled to said input buffer, said motion compensator adapted to generate motion vectors for a frame at said second resolution using motion vectors from said input data.

22. The system of Claim 19 comprising:

a rate controller coupled to said input buffer, said rate controller adapted to determine a quantization step size for a frame at said second resolution according to quantization parameters from said input data.

23. The system of Claim 19 wherein said input data are compressed according to a discrete cosine transform-based compression scheme, wherein said input data comprise discrete cosine transform (DCT) coefficients.

24. The system of Claim 19 wherein said media data are selected from the group comprising: video data, audio data, image data, graphic data, and web page data.

25. A computer-usable medium having computer-readable program code embodied therein for causing a computer system to perform a method comprising:

accessing input data residing in a buffer, said input data comprising compressed data for a frame of a plurality of frames, wherein said frame is at a first resolution;

generating compressed downsampled data by downsampling said input data, said compressed downsampled data at a second resolution that is reduced relative to said first resolution, said compressed downsampled data used to generate a frame at said second resolution;

generating decompressed downsampled data at said second resolution by decoding said compressed downsampled data; and

generating decompressed data at a resolution corresponding to said first resolution by upsampling said decompressed downsampled data, said

decoding and said upsampling performed provided said decompressed data are needed as a reference for another frame.

26. The computer-usable medium of Claim 25 wherein said computer-readable program code embodied therein causes a computer system to perform a method comprising:

accessing motion vectors for said frame at said first resolution; and

deriving motion vectors for said frame at said second resolution from said motion vectors for said frame at said first resolution.

27. The computer-usable medium of Claim 26 wherein said motion vectors for said frame at said second resolution are generated by averaging said motion vectors for said frame at said first resolution.

28. The computer-usable medium of Claim 25 wherein said input data are compressed according to a discrete cosine transform-based compression scheme, wherein said input data comprise discrete cosine transform (DCT) coefficients.

29. The computer-usable medium of Claim 25 wherein said computer-readable program code embodied therein causes a computer system to perform a method comprising:

accessing quantization parameters for said frame at said first resolution; and

deriving quantization parameters for said frame at said second resolution from said quantization parameters for said frame at said first resolution.